were recreational divers attempting technical-level dives without the proper training or equipment. A trained technical diver using mixed gas (allegedly 17% oxygen, 50% helium and 33% nitrogen) had penetrated a deep wreck and become separated from his companions. He was found on the bottom with his tanks empty. He was using his breathing mixture to inflate his dry suit, a practice which may have resulted in hypothermia.

In an example of untrained divers attempting technical-level dives, two divers going for their “personal best” depth records planned a dive past 60 m (200 ft). Neither returned.

In one of six cave-diving deaths (three among trained cave divers, three without cave training), a 23 year old certified cave diver lost contact with the guideline in zero visibility during a very difficult penetration. His body was recovered several days later. Death was due to drowning after running out of air.

Two divers planning to spearfish entered a frozen quarry without lines, safety divers, or any kind of topside support. They became lost, ran out of air, and drowned.

A freshwater wreck diver failed to return after a dive to a 27 m (90 ft) deep shipwreck. His body was found sitting in the engine room with his gear off but his regulator still in his mouth. Apparently he had removed his gear in an attempt to enter a confined space, but lost visibility and simply remained where he was until his air ran out.

What can we learn from these tragedies? Mostly things that we should already know but may not be practising. Drugs and diving are not a good combination. Don’t run out of air underwater. If you run out on the surface, don’t panic: get buoyant as soon as you can, stay buoyant unless you intend to descend, flip onto your back or use your snorkel, drop your weight belt if necessary and if you inhale any water, cough it out or swallow it. In virtually all the surface incidents, and most of the underwater incidents except those in which both buddies got lost in an overhead environment, having an attentive buddy on hand probably would have made the difference between life and death.


The address of UNDERCURRENT is 1001 Bridgeway, Suite #649, Sausalito, California 94965, USA.

SUB OCEAN SAFETY

A newly organised, non-profit group responds to the emergency medical needs of Miskito Indian divers

There is a land where nitrogen eats the spines of hunter/divers and everything you have been taught about safe diving is rejected as a cowardly waste of time and money. To dive here, a man must face nameless sea demons who randomly strike the life from young divers. Ignorance and greed have built this system; it will be righted with education and a helping hand; but first it must be revealed to you.

Concealed on the remote Miskito Coast of Honduras, hidden from time, lies the jungle village of Kalquira. Its people survive in cruel paradox, with one foot in Eden and the other in hell. Here, where tropical fruit drips from trees, lives the largest contingent of commercial scuba divers the world has ever known, 95% of whom have been totally untrained in diving physics.

Kalquira is an average coastal village in the Gracias a Dios province, where 45,000 Miskito Indians live and 5,000 young men dive for the lobster industry. The lobster and conch diving industry has employed 90% of the workers here for the last 20 years and totally dominates the economy. Modern technologies have displaced the old ways of hunting on the sea and now a grim price is being paid. 125 lobster divers live in Kalquira, 45 of whom are suffering from paralysis induced by decompression disease, an illness caused by breathing compressed air under water for too long at too great a depth. Their symptoms include loss of sphincter and bladder control, impotence and rotting skin ulcers; their life expectancy runs from two to three years, or less.

Almost all these men have families. Many victims are only in their late teens, most are in their twenties and early thirties. Of the “healthy” men who still dive, 100% exhibit classic symptoms of decompression disease, from joint deterioration through loss of equilibrium. They are all teetering on the brink of paralysis whenever they work. This nightmare has infected every community on this ancient coast, where once productive fathers rot away and desperate wives turn to prostitution to feed their children. Thousands have been injured; everyone is affected. Here is a primitive land, where sea devils possess the souls of crippled divers and witches burn men’s spines to exorcise them. There is a better way.

This malignant pandemic of decompression disease has roots too complex to fall into any traditional relief categories and has grown unchecked. In answer to this challenge, Sub Ocean Safety, a non-profit organisation, has risen.
Forged from the impossible dreams of hyperbaric medical director Dr Thomas Millington and diver/publisher Robert Izdepski, SOS has become a driving force in diving safety and environmental action, tested under fire in one of the most remote and dangerous regions of this planet.

In 1991, Dr Millington, himself, delivered a Vickers mono-place single lock recompression chamber to the Moravian Mission Clinic in Ahuas, Honduras, and began publicising the decompression crisis there, ultimately capturing Izdepski’s attention in 1993.

Izdepski, with his son, Jesse, immediately went to Mosquitia to investigate, and since the revelations of that first shocking investigation, his *Universal Diver Magazine* (then THE WORKING DIVER) has diligently funnelled equipment and expertise into SOS, working extensively at the magazine’s own expense. “This was more than a magazine story to me,” says Bob, “It was the ultimate diving horror from the dark ages. I staked everything on this issue and publicly vowed to change the lobster industry for the better. That’s what we’re doing.”

In March of this year, with financial assistance from the Association of Diving Contractors, Hyperbaric Oxygen Therapy Systems Inc., and TACA Airlines, Dr Millington, expedition videographer Jorge Torres, Robert Izdepski and another of his sons, Caleb Windship, successfully transported a 4,000 lb., 48” double-lock recompression chamber (donated by CAL DIVE, INTERNATIONAL) from Guanaha Island to the Moravian Mission Clinic at Kalquira, retracing the route sailed by Columbus in 1502.

The chamber was loaded aboard a Guanaha lobster boat, through arrangements with “Coping”, a lobster boat owners’ association. Bob and Caleb went to sea with it, heading east toward Cape Gracias A Dios.

Near the Honduran/Nicaraguan border, the ship was prohibited entry into Kalquira by a shallow bar at the mouth of a lagoon. Stranded offshore in building seas, resourceful actions saved the day; the chamber was pressurised with scuba tanks, manually cast overboard and floated through the surf into a crocodile infested lagoon, where it was dragged 12 miles to the shores of Kalquira. Then, using Egyptian technologies and Louisiana riggin’, Bob, Caleb and 50 Miskito Indians slaved for two more days, inching the chamber 100 yards from the water into the clinic.

Meanwhile, back in Guanaha, Millington and Torres shot several videos of lobster divers in action, above and below the water, made an “on board” instructional video of a decompression incident of paralytic bends and its subsequent resolution using in-water oxygen therapy, interviewed the Coping association leaders and filmed the inner workings of a lobster processing plant. Torres (winner of the World Press International award for photographic arts) then joined the Izdepski team in Mosquitia to video some epic diver interviews.

This most recent SOS expedition was successful in many more ways than one. After convincing Coping that the *SOS safety and environmental solutions* were not only feasible, but made economic fishing sense, Coping provided practical and financial assistance to the expedition. “We realise that the boat owners did not plan out this evil, they simply did not have the knowledge or incentives to resolve it. We provided both by working with them, rather than just pointing fingers, and together we were able to find mutually beneficial solutions. The complexities of these problems break down when reasonable people communicate. I respect the boat owners for their many accomplishments, and I am glad that we could show them how they could increase profits, in both the short and long terms, by increasing safety aboard their vessels and working toward a sustainable fishery. It was most satisfying.” says Izdepski.

Word of this amazing expedition is just getting around now and it has already attracted internationally recognised authorities to the SOS Board of Directors. We now seat Dr David Youngblood (specialist and clinical director of hyperbaric medicine), Jolie Bookspan, PhD, (research physiologist studying the effects of heat, cold, altitude and immersion on decompression), Professor Bernard Nietschmann of UC Berkeley (leading authority on coastal indigenous peoples and marine habitats), David Cressy (former New Orleans City Attorney), as well as Dr Millington (Director of Hyperbaric Medicine, Pleasant Valley Hospital), publisher/saturation diver, Robert Izdepski and his wife Susan, who runs a private school.

This unique blend of expertise has produced a specific prescription for this third world crisis; a crisis that reaches far beyond the shores of Mosquitia.

Reports of expanding epidemics of killer decompression disease have reached SOS from around the world, from Colombia and Brazil to Borneo and Viet Nam; wherever advancing scuba technologies have impacted third world fisheries without provisions for diver education, families are destroyed by the spectre of paralysis and death. The social and economic costs of this world-wide pandemic are astronomical already, and growing exponentially. The solutions lie with emergency hyperbaric medical treatment, diving education, sustainable fishery planning and enforceable regulations. Enter, SOS.

SOS is responsible for two recompression chambers in Mosquitia, diving and medical training (there are now four dive schools in Mosquitia thanks to the Moravian Church, instructor Bob Armitage, and SOS), instructional videos, the recent implementation of lobster fishing seasons and proposals in front of Honduran government
regulators now, including: requirements for the certification of divers and boat captains to standards, air compressor regulations, required on-board oxygen and medical supplies, diving depth limitations, diver physicals, mandated diver use of standard safety equipment, depth and pressure gauges, watches, etc., lobster size limitations, and a ban on harvesting egg bearing females.

On March 28th of 1995, raw footage from the SOS expedition video was shown by Izdepski to a gathering at the Undersea and Hyperbaric Medical Society’s Gulf Coast Chapter meeting, astounding that “case hardened” audience with revelations of atrocities unknown and scenes of decisive action. Bob was subsequently honoured by an invitation to speak at the banquet, unexpectedly given donations to SOS by UHMS and the American College of Hyperbaric Medicine, and was further honoured with an additional invitation to speak and show the expedition video at the International UHMS meeting in Palm Beach, in June 1995.

SOS now controls four recompression chambers that can be used to reverse diver paralysis. Only one is operational. The chamber in Kalquira still lacks an air compressor, radios, air and oxygen hoses, O2 regulators and miscellaneous equipment. The other two chambers await funding for repairs and transportation. Organisational funding is desperately needed to improve communications.

Only now do we take time from our efforts to ask for help. This monster is just too big and dangerous for us to continue our struggles alone; in fact, our silence is in danger of becoming counterproductive to our causes. Though adverse to asking for funding, our recent successes make it more honourable: I hope you will understand, there is simply no other way.

**We have done all we can in getting this far. If you wish to assist us in any way, please contact us, we need your help now.**

Strengthened by its recent victories and bolstered by its growing support, SOS is in a position to use its Mosquitia experiences to continue its work around the world; wherever greed and ignorance propel the horrible exploitation of divers and their environment. We invite you to put flesh and bone into our strategies, enlist in our bold expeditions, inform us of regions where unbridled exploitation rules the sea. We have only won some battles, to win the war we need you to send us where we cannot go and put your strength in our hands.

For information contact:
Sub Ocean Safety
PO Box 834 Lacombe, LA, USA, 70445
USA free call 1-800-867-3807, Phone 504-882-7875
Fax 504-882-6416

This announcement follows on from the article, *Paralysis, starvation or famine: the Miskito dichotomy continues* by Bob Izdepski published in the SPUMS Journal in March (1995; 25 (1): 45-51).

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**SAFE LIMITS: AN INTERNATIONAL DIVE SYMPOSIUM**

**AN OCCUPATIONAL MEDICINE POINT OF VIEW**

David Smith

In this paper, I intend to put an occupational medicine view on some aspects of health and safety in the diving industry.

Accidents are a bit like theatre. The scene is set, the players are all waiting in the wings and the props are in place, just waiting for the curtain to rise. There is a point at which the accident becomes inevitable. If only we were gifted with foresight, we could rewrite the script so that the accident could not happen.

But health and safety is about having foresight and processes have been developed to identify high risk situations which lead to the inevitable accident. Risk management is the process.

No one would dispute that diving is a high risk industry, but I am far from convinced that all employers (operators) in the diving industry apply the principles of risk management that are expected in other workplaces such as those in the metal and construction industries. I suspect this is because this industry grew out of a sport and is still perceived as one by most people. Nevertheless, formal risk management strategies are essential in any high risk operation.

This is a four step process:
1. Hazard identification,
2. Risk assessment,
3. Application of control measures and
4. Re-evaluation of controls.

Hazards are the things that have the potential to cause an injury or illness. For any particular type of diving they are usually well known. Risk is the likelihood of an adverse outcome eventuating from hazards present. Risk is dependent on many factors involving the workplace, the